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**On the North American Species of CATOCALA.**

BY AUG. R. GROTE.

The present paper is a mere outline of one in which all the North American species, known to me belonging to the genus *Catocala*, were fully and comparatively described, and of which paper I have been so unfortunate as to lose the manuscript in transportation. The material on which my MS. was based is now in part inaccessible to me, having been returned to various collections. I remember to have pointed out in my lost MSS., that, although well represented in both Europe and Asia, the genus seemed to have its largest representation in North America and to attain with us its fullest development. Here we have a number of species in which the hind wings are wholly black above, such as *C. epione*, *C. viduata*, *C. tristis*; species which have no described analogues in other countries. Again, we have a little Group (*Corisce*, *Hübner*) comprising species without the usual black median band on the hind wings above; little species with yellow secondaries and peculiar in appearance, but which seem to offer no structural characters on which to separate them generically. Geographically considered the genus belongs to the Northern Hemisphere.

I treated at some length the structure of the genus and dwelt on the ornamentation. It suffices me now to point out that while the primaries above offer the normal lines and enclosed spots common to the Noctuidæ, that the median space shows in addition a ringed spot, the subreniform, beneath the reniform spot. I have found by the study of such species as *C. piatrix*, that this spot is in reality a part of the transverse posterior line which is here inwardly inflected. And although the subreniform is more frequently a perfectly isolated and independent annulus, when also the t. p. line is continuous and unin-

flected, still it is in *C. piatrix*, *C. insolabilis*, etc., usually open and thrown outside of the t. p. line into the subterminal space. I have not met the subreniform spot of *Catocala* in other genera of the family, so that this explanation of its origin seemed interesting to me. I followed a grouping of the species according to the color and appearance of the secondaries for convenience of reference, and indeed in the majority of cases this arrangement seemed natural. The little *C. tristis*, however, appeared more properly associated with the slenderer yellow winged species, than with the heavier insects of its group.

I arranged the North American *Catocalæ* as follows:

Secondaries black and unbanded above.....	Species	1— 8.
Secondaries black above with a white band.....	“	— 9.
Secondaries various shades of red above with black median band	“	10—23.
Secondaries orange above with a black median band.....	“	—24.
Secondaries black above with a narrow median yellow band.....	“	—25.
Secondaries yellow above with a median black band.....	“	26—51.
Secondaries yellow above without a median band.....	“	52—54.

### 1. *Catocala epione*, Westwood.

*Noctua epione*, Drury.

♂ ♀.—A species of medium size and readily recognisable by the broad black transverse lines of the primaries above. The subreniform is moderate, irregularly pyriform, pale. The reniform is large, rather vague, with a brown annulus and stain. The t. p. line has a moderate single acute tooth opposite the cell and is followed by a distinct brown shade band, and this again by a pale shade following the serratures of the subterminal line. Hind wings deep black above, with long pure white fringes and fuscous hair at base and along internal margin. Beneath, the wings are almost wholly blackish with an iridescent tinge; hind wings with a hardly perceptible trace of the usual bands. Primaries with a narrow whitish subterminal band becoming obsolete before internal margin, and a broader internal and shorter band discontinued below vein 2.

I have seen many specimens from the Middle and Southern States. From Abbot's figures Guenée described the larva found on oak. The imago is quickly distinguished by the broad and comparatively even lines of the primaries above; occasionally the t. p. line is connected with the subreniform.

### 2. *Catocala lachrymosa*, Guenée.—

Described comparatively with *C. epione*, this is a species I have never been able to identify. We are led to look for a near ally of *C. epione* with, apparently, the same facies. It should be recognisable from the unusual character afforded by the subterminal line which is stated to be distinct and very black.

### 3. *Catocala insolabilis*, Guenée.

♂ ♀.—The primaries are frosted with glaucous white or ashen scales. The lines are narrow, indistinct and the t. p. line, with two not very acute subequal teeth opposite the cell, sweeps inwardly and includes the subreniform. Usually the internal margin is suffused with black, obscuring the lines inferiorly, but not always. Reniform moderate, vaguely ringed, with a white external and small brown ovate internal annulus. Secondaries wholly black above, with black fringes. Beneath body and base of both wings white. Narrow and faint white external bands on both wings.

This is the first of a number of closely allied species of which the stoutest is Guenée's *C. viduata*, than which this is much slighter. We must look for the dusky primaries and powdery squamation with its bluish tinge, and the ovate narrow internal brown annulus of the reniform as ready distinguishing characters. I have a specimen with unicolorous griseous smooth primaries, secondaries with whitish fringes, which I think is a variety; more material may, however, show that we have to do with a distinct species.

### 4. *Catocala viduata*, Guenée.

*Catocala vidua*, Guenée, p. 94.

♂ ♀.—Robust; altogether the stoutest bodied species of the genus. Wings dentate. Primaries with the cinereous colors underlaid with pale brown; on the nervures powdery glaucous scales. The reniform is large, vague and spherical. A very prominent black shade sweeps downwardly and outwardly from costa above the reniform and runs to external margin which it joins below the apices. This black shade, which is the median shade, is present in the following and may be traced in other species, but is nowhere as determinate as in *C. viduata*. The t. p. line is followed by the broad pale brown subterminal space, which is edged again outwardly by the diffuse white border of the obsolete subterminal line. Unusually long thick and pale hairs at the base and along internal margin of the black white fringed secondaries. Centrally the fringes are interrupted with black. Beneath the body is dirty whitish; wings white at base; bands tolerably distinct. Exp. 90 to 95 mm. Length of body 38 to 40 mm.

For this species I have taken the name proposed by Guenée in the appendix to his work. I do not believe this to be Abbot's species, whose figure rather resembles *C. desperata*. But, under all the circumstances, it does not seem worth while to adopt Smith's specific name.

Louisiana, Virginia, Pennsylvania. Rare.

### 5. *Catocala desperata*, Guenée.

? *Phalaena vidua*, Abbot & Smith.

♂ ♀.—Well sized, clear grey, white and black. All the lines distinct and colors bright. A basal longitudinal dash; another crossing the outwardly broadly marked geminate transverse anterior line. Reniform with double annulus, whitish, well sized; subreniform white, included by the t. p. line. Median shade fainter than in *C. viduata*; subterminal line tolerably distinct, preceded

by a white shade; subterminal space dull brown, not as in *C. viduata* and the preceding species bright brown. Fringes of secondaries pure white. Thorax bright grey with the black markings distinct. Expanse 80 to 85 mm.

Common throughout the Middle and Southern States in various localities.

6. *Catocala resecta*, *Grote*.

♂ ♀.—This species closely resembles *C. desperata*, but it is smaller. The diffuse black median shade is wanting. The black longitudinal dashes at base, across the t. a. line, and across the t. p. line on sub-median interspace, are very distinct and the two subequal teeth of the transverse posterior line are, as usual, shaded with black. Beneath much as in *C. desperata*. Expanse, 70 mm. Length of body 30 mm.

A few specimens examined from the Middle States.

7. *Catocala flebilis*, *Grote*.

♂ ♀.—Peculiarly pearly cinereous, quite unlike in tint of primaries to any of its allies, than which it is smaller. The black longitudinal dashes of *C. desperata* and *C. resecta*, are less prominent. Transverse lines not geminate, fine, distinct but fading towards internal margin. Reniform vague, with a narrow outer whitish ring and nearly filled with a pale brown center; subreniform entirely open, concolorous, slightly touched with blackish from the diffuse shadings crossing the t. a. line. Subterminal line very indistinct. The usual black shading running upwardly from the teeth of t. p. line to external margin. Hind wings very black with white fringes. Beneath body and base of wings white. Differs by the narrowness of the white space between the central black fascia and the broad border on hind wings. Primaries have a whitish blotch on cell and external white fascia nearly obsolete. Expanse 66 to 69 mm.

Several specimens examined from Pennsylvania.

8. *Catocala tristis*, *Edwards*.

♂ ♀.—I have seen but two specimens of this pretty little species from New York and Pennsylvania. It is readily recognisable from the secondaries being unbanded beneath. It is the smallest known species with black secondaries, and resembles rather *C. gracilis* or even *C. androphila*, than the species with which I here associate it from the color of its secondaries. My detailed description is lost with my original MS. and I have returned my material.

9. *Catocala relictæ*, *Walker*.

♂ ♀.—This is the North American representative of the European *Catocala fraxini*. In the male the primaries above are nearly entirely white and the blackish powdery ornamentation is subobsolete. The female is darker and has the lines of the primaries evident. The narrow central fascia of the secondaries is pure white. It cannot be mistaken for its European ally, than which it is a little smaller and Guenée,

who says: "je l'ai recue également de l'Amerique Septentrionale, ou elle ne diffère en rien de nos individus européens", in speaking of *C. fraxini*, must have erred in his locality, for *C. fraxini* does not occur in North America. Expanse 74 to 77 mm.

More commonly taken in Canada and the Eastern States, *C. relictæ* is rare in Pennsylvania and I have seen no specimens from the South.

10. ***Catocala californica*, Edwards.**

♀.—This species resembles the European *C. elocata*, and is another instance of the affinity existing between the Californian and European faunæ. Our species from the eastern slope which resemble *C. californica*, *C. elocata* and *C. nupta*, with powdery grey ornamentation of primaries and straighter lines, differ by the more oblique external margin and produced apices. *C. californica* has the secondaries dark rose red. The median black fascia is not constricted but terminates rather abruptly much before the margin. Expanse 58 mm.

11. ***Catocala briseis*, Edwards.**

♀.—I have seen a single specimen of this species which is recognisable from the unusually dark primaries relieved by the white dentate shadings of the subterminal line. It is stouter than *C. californica* but a smaller species than *C. unijuga*. My detailed description is lost and I have no longer the specimen in my keeping. New York State.

12. ***Catocala unijuga*, Walker.**

♂ ♀.—A fine large species with dark powdery grey primaries. Transverse anterior line indistinctly geminate with an evident internal white shade. Disc before the ordinary spots pale and the subreniform is paler than the large concolorous bisannulate reniform. T. p. line without very prominent teeth but broadly marked and inflected on s. m. interspace. Subterminal line distinct and evenly dentate, preceded by a distinct white coincident shade. Wings strongly dentate. Secondaries bright red. Median band not constricted medially, tapering obsoletely towards internal margin which it nearly attains. Beneath the band terminates abruptly long before the margin. Expanse 72 to 80 mm.

Not uncommon in Canada and the Eastern and Western States.

13. ***Catocala junctura*, Walker.**

I have seen the specimen in the British Museum described by Mr. Walker. It seemed to me to differ principally from *C. unijuga* by the more attenuate median band of the secondaries. I have a specimen before me, which I doubtfully refer to this species, received some time ago from R. Stratton as collected in Maryland and which differs from *C. unijuga* in the less distinct subterminal line and obsolete white shad-

ing of the primaries, while the median band of the hind wings is medially greatly constricted and abruptly discontinued before internal margin.

14. **Catocala Walshii**, *Edwards*.—

This species is unknown to me.

15. **Catocala parta**, *Guenée*.

♂ ♀.—Wings dentate, squamation smooth. Primaries dull cinereous, with a slight yellowish cast. Transverse lines fine, obsoletely geminate. Reniform, preceded by a distinct whitish shade on the cell, with its external annulus dentate outwardly. Subreniform large, pale, subquadrate. The subapical streak, from the t. p. line to extreme margin, is broad distinct and black. Subterminal line distinct, regularly dentate, preceded by a narrow coincident white shade; subterminal space with a pale brownish tint. Hind wings dull red with an even black median band nowhere constricted and terminating much before internal margin. Beneath, the band is quite irregular and the wing is stained with red inferiorly. Expanse 72 to 74 mm.

The larva of this species feeds on different species of Willow (especially *S. Babylonica*) and the imago is very common in July in the suburbs of Brooklyn, L. I.

My material has come to me from Massachusetts, New York and Pennsylvania. The determinations of this species and *C. amatrix* in the British Museum Collection and Lists are erroneous.

16. **Catocala coccinata**, *Grote*.

♂ ♀.—A little smaller than *C. parta*, which this species resembles in the appearance of the primaries. Clear cinereous; before the reniform, which is smaller and paler than in *C. parta*, the wing is whitish and occasionally allows the crimson underface to be reflected. Subreniform whitish and large. T. p. line more outwardly projected than in *C. parta*; below the two prominent teeth the line retreats inwardly more evenly and deeply and here the subterminal space is whitish. The inward inflection above vein 1, is deeper than usual and nearly reaches the t. a. line, constricting the median space thereby and offering a quick character on inspection. Secondaries bright crimson. Median band even and continued. Beneath the fore wings are stained with crimson to the median black band and on the secondaries below the median vein. Expanse 64 mm.

My specimens are from Pennsylvania. *C. coccinata* resembles *C. parta*, while a slenderer species, in appearance of the primaries, while the secondaries are as brilliantly colored as those of *C. cara*.

17. **Catocala ultronia**, *Hübner* sp.

♂ ♀.—This species I have taken in May in Alabama and it is commonly found throughout the Middle and Eastern States. It is so well known that I may be spared any description here. An excellent illustration of it is given by Dr. Packard in his Guide to the Study of Insects.

**18. *Catocala amatrix*, Hübner sp.**

*Catocala selecta*, Walker.—var. *Catocala nurus*, Walker.

♂ ♀.—A fine large species with soft brown primaries, the lines and spots indistinct. Sometimes the wing is suffused longitudinally with blackish from the base outwardly; this is Mr. Walker's *C. nurus*. Secondaries bright rose pink; the median black band broad and even, terminated before the internal margin. Expanse 74 to 86 mm.

Of common occurrence in various localities throughout the Eastern and Middle States.

**19. *Catocala cara*, Guenée.**

♂ ♀.—Primaries deep blackish-brown above. The lines narrow, velvety black, better marked superiorly, tending to become obliterate towards internal margin. Ornamentation much as in *C. amatrix*; the lines and veins are shaded and marked with olivaceous scales. Hind wings deep intense rose red with an unusually broad and even black median band continued to internal margin. Basal hairs black. Expanse 85 to 90 mm.

A still more beautiful species than *C. amatrix*, to which it is allied, but *C. cara* is stouter and more brilliantly colored than its ally.

In the same localities with foregoing and occurring as frequently. Also from Southern States.

**20. *Catocala concumbens*, Walker.**

♂ ♀.—Also allied to *C. amatrix* but a much smaller species. Primaries pale brownish evenly frosted over with whitish scales. Collar soft brown, discoloured with the cinereous thorax. Ordinary lines black, narrow and distinct. Reniform vague, whitish, with a dark internal annulus. Subreniform open. Secondaries bright pink with a broad abbreviate median black band; fringes white. Beneath, the band is narrower and more irregular. Average expanse 68 mm.

More common Northward; my specimens are from Canada and the Eastern States. Abundant in some localities. The larva has been described by Mr. Wm. Saunders.

**21. *Catocala marmorata*, Edwards.**

I have seen the type of this large species which I regard as allied to *C. ilia*. My detailed description is now lost and I forwarded the specimen to New York to be figured, so it is now inaccessible to me. The species is from Yreka, California.

With regard to the specific name this is already used in the Noctuidæ for a species of *Hadena*. It has been hitherto the custom to reject such names, but this should not be done where, as in the present case, there is no danger of confusion.



22. **Catocala ilia**, *Cramer* sp.

♂ ♀.—Primaries dark cinereous, powdered with glaucous scales and shaded with black. A basal ray. T. a. line geminate. Reniform whitish with a small black internal ring. Subreniform pale, subquadrate, connected usually with the t. p. line. Beyond the spots the median space is shaded with black. Sometimes the whole wing is shaded with blackish to t. p. line, leaving the reniform as a large white blotch without the annulus. Again the wing wants the glaucous scales and the reniform is concolorous, or merely shows a few white scales. Secondaries orange red with an irregular black median band tapering to the margin. Basal hairs fuscous. Average expanse 75 mm.

An exceedingly common and very variable species, found in Maryland and Virginia.

23. **Catocala uxor**, *Guenée*.—

This species has not been recognised by me. I am disposed to regard some of the varieties of *C. ilia* as intended. The use of the specific name is objectionable.

24. **Catocala innubens**, *Guenée*.

♂ ♀.—A species of moderate size with rich brown primaries, powdered with glaucous scales. The lines are distinct, black and not very jagged. The subreniform is small, and pale and a ready character. The wings tend to be diffusely shaded with deep brownish from the base outwardly. Secondaries reddish-orange, with a broad tolerably even median band which tapers suddenly towards internal margin where it becomes lost in the long dull colored hairs which clothe the base and internal edge of the wing. Expanse 65 mm.

Not uncommon in the Middle and Western States.

This species must not be confounded with *C. muliercula*, *Guenée*, which I refer to the following section from the color of its hind wings, and which wants the whitish serrulate shading before the subterminal line characteristic of *C. innubens*. I now consider as a well marked variety merely of *C. innubens* :

a. **Catocala scintillans**, *G. & R.*

Both sexes of this form have occurred rarely. The primaries above are intensely and entirely blackish brown to the transverse posterior line, and this portion of the wing is overlaid by bronze or glaucous metallic scales arranged in fine wrinkled lines which in certain lights are brilliant. I was first led to associate *C. scintillans* with *C. innubens*, by seeing an analogous variation in *C. ilia*, and on detecting the glaucous scales of *C. innubens* to be brilliant in certain lights. Certainly the two look very distinct, but there seem no other palpable differences, while the paler apices and terminal space and whitish subterminal line of *C. innubens* are well expressed in *C. scintillans*. Besides, a specimen of *C. scintillans*, in Mr. Edwards' Collection, shows the t. a. line and the subreniform spot of *C. innubens* plainly.

25. *Catocala cerogama*, Guénée.

♂ ♀.—A rather large species with the body parts proportionally slender. Forewings pale wood brown, frosted with white scales and shaded with bright brown and whitish. T. a. line geminate, strongly marked outwardly to submedian interspace, to below the white and prominent sub-reniform. A broad whitish shade extends downwardly and outwardly obliquely from costa over the diffuse pale brownish reniform spot, bringing the strongly marked t. a. line, which it margins inwardly, into relief superiorly. T. p. line black and distinct to 2d nervule, accompanied by bright brownish shades; the brown bright color obtains between the t. p. line and the whitish bordering of the dentate subterminal line. The veins tend to being marked by dark scales. Hind wings black with an even narrow median yellow band. Base clothed with long pale fuscous hairs, beneath which the yellow scales that clothe the wing may be detected. Thus, in reality, the hind wings do not differ from those of the succeeding group in pattern. Beneath, with primaries, they are pale yellow, crossed by a broad median and marginal black band, the latter retired from the edge of the wing. Expanse 75 to 85 mm.

Not common. Eastern, Middle and Western States.

26. *Catocala neogama*, Guénée.

♂ ♀.—A stout bodied species of strong habit. Primaries above cinereous, varying in depth of shade. Basal half line black, distinct, and there is a basal ray, usually evident, accompanied by a brown shade. T. a. line better defined superiorly and outwardly and, with the t. p. line, accompanied usually by bright brown shadings. Reniform tolerably large and distinct, with an interior shaded brown annulus; the disconnected subreniform is pale and moderate though well defined. T. p. line single with two strong subequal teeth and a strongly marked inflection on s. m. interspace. Subterminal interspace usually bright brown. S. t. line inconspicuous; the usual sub-apical dark shade or streak. Hind wings dark yellow with an irregular median band, tapering, but continued beneath the longer dark fuscous hair to internal margin, constricted superiorly. Basal hairs dark. Beneath all the black bands very attenuate. Expanse 80 to 82 mm.

Eastern and Middle States; very common.

I do not believe this to be the *Phalaena neogama* of Smith. In the Berlin Museum I have named this species *Catocala communis*, while two specimens from Texas therein contained differed from the present by their brighter colored secondaries, and otherwise more nearly resembled Abbot's figure. I determined these two latter specimens as *C. neogama*, Smith sp. I have no further material from the South at the moment before me, but believe my determinations in 1867 will be justified by future discoveries.

27. *Catocala subnata*, Grote.

*Catocala subnata*, Grote, Proc. Ent. Soc. Phil. p. 327 (1864).

♂ ♀.—Anterior wings pale grey with a greenish or bluish tinge. All the lines are narrow, better defined superiorly, not very distinct. Reniform smaller, less prominent than in *C. neogama*, Guénée, which this species closely

resembles. Sub-reniform large, open, formed by a deep sinus of the t. p. line. Hind wings bright yellow; hairs at the base and along internal margin more yellow, less obscurely colored than in *C. neogama*. Median band as in *C. neogama*, but less irregularly edged. Thorax pure grey; body parts paler than in *C. neogama*. Expanse 80 to 90 mm.

Middle States. Rare. "Kanawha, 1867" ♀ Edwards' Collection.

Differs from *C. neogama*, *Guenée*, by its slender body parts and greater expanse. At first sight it resembles it closely, but the large open sub-reniform, the paler hind wings, and the more acutely dentate t. p. line are distinguishing characters.

## 28. *Catocala piatrix*, *Grote*.

*Catocala piatrix*, *Grote*, Proc. Ent. Soc. Phil. Vol. 3, p. 532 (1864).

♂ ♀.—A well sized species with slenderer body parts than *C. neogama*, but stouter than the succeeding species, *C. palaeogama*, with which Mr. Walker has confounded it. Very distinct in color and appearance from its allies. Anterior wings dark wood brown, or blackish brown, slightly silky, darker shaded in the sub-basal space, on the costa above the discal cell, and obliquely subapically on the terminal space. When fresh with powdery greenish scales along the the veins. Lines black. Basal half-line with a single tooth, terminating with an outward inclination. T. a. line geminate, with the outer line sometimes less distinct, with an obsolete sub-costal tooth, irregularly undulate, divaricate. A paler costal shade spreads obliquely from costa over the subreniform. Reniform shaded with black, thrice excavated exteriorly, followed by a blackish shade. Subreniform usually closed but connected with the t. p. line, occasionally open, always paler and well defined. T. p. line black, distinct, without dilations, a prominent sinus on s. m. interspace; discal teeth sub-equal and prominent. Subterminal line geminate, with a greyish center. Hind wings deep yellow, internal margin and base clothed with long dark brownish hair. Median band broad, not much constricted, tapering suddenly to internal margin. Thorax concolorous with primaries; tegulæ bordered with black lines; prothorax with a black line. Expanse 78 to 84 mm.

Not rare throughout the Atlantic District. I have a specimen from Southern Alabama.

## 29. *Catocala palaeogama*, *Guenée*.

*Catocala palaeogama*, *Grote*, Proc. Ent. Soc. Phil. Vol. 3, Plate 3, fig. 2 (1864).

♂ ♀.—Anterior wings grey, powdered with greenish grey and black scales and shaded with blackish, and with bright brown on the subterminal space. Ordinary lines black, rather broad and distinct. Reniform moderate, rounded, indistinct, with a brownish center, sometimes entirely black. Sub-reniform pale, small, independent or rarely connected with t. p. line. Sinus of t. p. line on submedian space broadly marked, acute, not deep. Hind wings dark yellow. Median band narrow, much constricted, tapering wavyly to internal margin. Expanse 72 to 75 mm.

Less common than the preceding species. Eastern and Middle States.

A well marked variety of this species is :

**α. *Catocala phalanga*, Grote.**

♂ ♀.—Primaries paler than in type, pale greenish grey, whitish before the reniform on median space. Base of the wing suffused with black and the narrow subterminal space entirely black between the t. p. and the white marked sub-terminal line. Reniform variable as in the type.

**30. *Catocala habilis*, Grote.**

♂ ♀.—Smaller and sligher than *C. palaeogama*, of the same general habit, with paler more evenly colored primaries. Fore wings pale grey with a greenish tint. All the lines black, narrow, often indistinct. Basal half-line and t. a. line as in *C. palaeogama*. T. p. line with less prominent teeth, and differing by being connected with and encircling the inconspicuous sub-reniform, which is usually open, a little paler than the ground color of the wing, moderate, subpyriform, excavated outwardly. The sub-median sinus is prominent and more broadly marked; the t. p. line followed by a faint whitish shade. The s. t. space is inconspicuously brownish; s. t. line faint, preceded by a whitish shade much as in *C. palaeogama*. Terminal interspaceal points evident. Secondaries dark yellow, a little paler than *C. palaeogama*; bands similar, the median a little broader, the marginal proportionally a little narrower than in *C. palaeogama*. Thorax pale grey, concolorous with primaries; thoracic lines sub-obsolete. Expanse 60 to 65 mm.

A number of coincident specimens examined from Pennsylvania.

**31. *Catocala consors*, Guenée.**

*Phalaena consors*, Smith.

♂ ♀.—A species of moderate size, a little stouter than *C. habilis*; the ornamentation of the primaries recalling *C. epione*. Forewings dark ashen, pulverulent, concolorous. Lines black and usually broad and evident. T. a. line outwardly oblique, waved, without costal tooth. Reniform large, with a narrow internal brown annulus, excavated externally. Subreniform small, nearly fused with reniform, pyriform, whitish or pale, evident. T. p. line, with a single not very prominent tooth opposite the cell, below which it is very moderately waved or dentated; submedian sinus moderate. Beyond it the s. t. is obscure brown, and then a broad greyish shade precedes the inconspicuous sub-terminal line. Hind wings bright deep yellow; median band twice constricted, flexuous; deep corresponding excavations are formed in the external band, while the yellow interspace between the bands is narrower than usual. Beneath the purplish-brown terminal shades are very broad on both wings. Expanse 60 to 63 mm.

Georgia. (Ridings.)

**32. *Catocala ponderosa*, G. & R.**

*Catocala ponderosa*, G. & R. Proc. Ent. Soc. Phil. Vol. 6, Plate 4, fig. 2. (1866).

*Catocala nebulosa*, Edwards.

♂ ♀.—A fine stout bodied species with somewhat of the habitus of *C. neogama*. Anterior wings greyish cream color, variable in depth of tint, much shaded with deep brown, transverse lines black. Basal space to t. a. line entirely suffused superiorly with blackish-brown. Median space usually pale or quite light, when it contrasts with basal and terminal coloration quite strongly. Reniform bisannulate, obliterate, concolorous. Subreniform small, entirely enclosed but connected with the t. p. line, distinctly margined, concolorous. T. p. line black, distinctly defined, slightly dilated before internal margin and

again immediately on costa, irregular, with two prominent teeth the lower of which is about a third shorter than the upper. Terminal space, with a purplish shade, brown, centrally shaded with paler scales. Posterior wings dark or deep yellow; the median band much as in *C. neogama*, but slightly broader, narrowing the basal yellow space which is more or less concealed by the longer hair-like basal scales. Head and thorax brown, tegulae with narrow marginal lines. Abdomen dust color, tufted on the basal segments. Expanse 70 to 75 mm.

Middle and Western States; not common.

Resembles *C. muliercula*, in color as much as any species, but larger, and little slenderer than *C. neogama*. The faint purple lustre of the primaries reminds one of *Erebus*, *Letis* and allied genera.

Mr. Edwards compares the secondaries quite wrongly with those of *C. cerogama*, which *C. ponderosa* in no wise resembles. The specific name chosen by Mr. Edwards had already been used five times in the family.

### 33. *Catocala muliercula*, Guenée.

♂ ♀.—Primaries deep brown, shaded with bluish over the paler median space. Lines black; t. a. arcuate, once waved on internal nervure; t. p. line with two equal projected teeth opposite the cell, below which it runs obliquely inwardly downward, slightly dentate, projected outwardly again before the slight sinus or internal nervure. A pale shade before the moderate reniform; subreniform quite small, very pale, evident, tending to be joined to the t. p. line. Hind wings bright deep yellow; basal hairs blackish; median band broad, continued, not constricted; marginal band broad, its inner edge twice lightly excavated, the lower notch the deepest. Abdomen basally tufted, dark above; thorax concolorous with primaries. Expanse 58 to 60 mm.

Middle and Western States. Rare.

Smaller than *C. innubens*, which has paler brown primaries powdered with grey, and orange secondaries.

### 34. *Catocala badia*, G. & R.

*Catocala badia*, G. & R. Proc. Ent. Soc. Phil. Vol. 6. Plate 4, fig. 1 (1866).

♂ ♀.—A moderate sized species of very distinctive appearance, reminding one a little of *Ophiusa*. Legs long, strongly spurred. Primaries pale chestnut brown with two transverse dark brown broad shades obscuring the ordinary lines. The first within the arcuate t. a. line, the second over and without the angulated t. p. line and neatly defined outwardly. The reniform is obscured. The t. p. line may be discerned with difficulty; it has a single tooth opposite the single more or less marked angulation of the outer edge of the dark shade; it runs deeply inwardly below the reniform, forming the open subreniform, and here greatly constricting the median space; below this it is a little irregular, forming an im prominent dentation on vein 1. Hind wings light bright yellow; median band not constricted, tapering towards internal margin before it expires; marginal band narrow with irregular or crenulated inner edge; fringes blackish. Expanse 58 mm.

Middle and Eastern States. Not rare; occurred frequently at Seekonk, Rhode Island.

35. **Catocala antinympha**, *Hübner* sp.*Catocala melanympha*, Guenée.

♂ ♀.—Smaller and slighter than *C. muliercula*. Primaries dead black, with velvety black lines defined by very narrow pale shades. Reniform with pale center and internal annulus. The brown color of the subterminal space fills in the large and open subreniform, within which the pale external edging of the t. p. line becomes more evident. The pale grey serrated shade before the s. t. line is tolerably distinct, as are the interspaceal terminal double, black and pale points. Hind wings light bright yellow with black basal hairs and an even well continued median band. Fringes black, whitish at apex. Expanse 54 mm.

Middle and Eastern States. Rare.

36. **Catocala serena**, *Edwards*.

♂ ♀.—Dusky ashen. Head, collar and costæ of primaries, more or less suffused or shaded with a darker blackish ashen tint. Lines fine. T. a. with a fine costal tooth, thence slightly waved to internal margin. T. p. line finely dentate, with a single slightly projected tooth opposite the cell. Reniform small, inconspicuous, single. Subreniform open, pale, formed by a deep sinus of t. p. line, which runs again deeply inwardly at internal vein. The pale serrated subterminal shade is evident, preceded and followed by dark shades. Hind wings rather light yellow, with a narrow angulated continued black median band tapering to internal margin. Basal hairs dusky. Marginal band broad, its inner edge even, angulated or elbowed. Beneath the bands are broad, leaving narrow yellow interspaces; body dark. Expanse 58 to 60 mm.

Several specimens from Pennsylvania examined. My good friend Mr. Sanborn has sent me a specimen from Massachusetts.

37. **Catocala illecta**, *Walker*.

♂.—A broad winged, moderately stout species, recalling *C. concumbens* in appearance and color of primaries. Forewings and thorax pale grey, lightly shaded, evenly colored; collar marked with brown linear shades. Lines fine and black. Reniform small. T. p. line acutely dentate, with a single strongly projected tooth opposite the cell (the usual lower tooth reduced), the moderate subreniform open, formed by a deep sinus of the t. p. line which is again rather deeply inflected on the internal nervure. Subterminal shadings very inconspicuous. Hind wings bright golden yellow without darker basal hairs. Median band proportionally narrow, once constricted, even, squarely and abruptly terminated much before the margin. Terminal band narrow forming a disconnected spot at the angle; fringes whitish. Abdomen yellow. Beneath, body and wings grey. Disc yellow; bands narrow; on secondaries median band discontinued superiorly, forming a discal lunule on the cell. Expanse 75 mm.

A single specimen without locality in Mr. Edwards' Collection.

38. **Catocala Clintonii**, *Grote*.*Catocala Clintonii*, Grote, Proc. Ent. Soc. Phil. 3, p. 89. Pl. 3, fig. 4 ♀, (1864).

I have fully illustrated this species, of which I have seen but few specimens from New York and Massachusetts, as above cited. It is rare in Collections and I have not yet seen the male.

39. **Catocala nuptialis**, Walker.

*Catocala nuptialis*, Walk. C. B. M. XIII, p. 1206 (1857).

This species I have not identified. The description in the British Museum Lists agrees in some points with the succeeding, without coinciding.

"United States."

40. **Catocala abbreviatella**, Grote.

♂ ♀.—Primaries smooth pale grey, but little shaded, a little darker terminally. Basal half line fine. T. a. line black, very broad and distinct, straightly outwardly oblique to below median nervure opposite the subreniform, thence entirely lost and obliterate. Reniform moderate, annulate, with a black spot inferiorly. T. p. line faint, obliterate, plainest opposite the disc, without prominent teeth, encircling the open subreniform, the inner edge of which latter, approximate to the extremity of the black portion of the t. a. line and superiorly touching the lower part of the reniform, is alone marked and distinct. Subterminal shades vague; sub-terminal space faintly tinted with brown. Hind wings bright yellow. A rather narrowed, slightly constricted median black band expires much before the margin. Hind border not wide, interrupted and forming a prominent spot at anal angle. Beneath, the median band is aborted superiorly. Thorax pale grey, collar with a darker stain. Abdomen dust color, pale. Expanse 46 mm.

Two specimens from Texas (Belfrage).

Resembles no species known to me in the peculiar appearance of the ordinary lines of the primaries.

41. **Catocala frederici**, Grote.

♀.—Front, between the eyes, narrowly longitudinally dark brown. Terminal palpal joints dark brownish, mixed with grey on 2nd joint. Basal joint pale. Vertex, collar and thorax very pale testaceous greyish or whitish, without markings; collar faintly olivaceous. Abdomen clear bright yellow; beneath paler. Legs pale greyish, tarsi annulate with black. Anterior wings with obliterate markings, somewhat dark olivaceous, but overlaid everywhere with pale scales, through which the lines are faintly visible. All the lines are dull olivaceous blackish, most strongly marked on costa. Basal half line distinct. The t. a. line appears widely geminate, the outer component line broadly trigonately marked on costa. Median shade irregular, perpendicular. Ordinary spots obsolete. Reniform apparently large and circular, succeeded by an irregular darker shade. T. p. line even, regularly scolloped and brought into relief by a coincident narrow very pale shade. Subterminal line dark, evenly dentate, slightly projected opposite the disc. A distinct terminal series of interspaceal black points and short pale streaks. Fringes pale. Secondaries largely clear bright yellow. A narrow black median band tapering inferiorly and discontinued shortly beyond its inward projection, expiring much before internal margin. Terminal band narrow, especially at apex where it is even and leaves a broad yellow apical space below which it is externally evenly scolloped. It is discontinued abruptly at 2nd nervule. At vein 1 on the margin is a faint black spot. Beneath both wings are clear yellowish with narrow terminal and median bands. Expanse 57 mm. Length of body 28 mm.

Two specimens from Texas (Friedrich) examined in the Berlin Museum. Very distinct in appearance from any of its congeners.

**42. *Catocala micronympha*, Guenée.**

♂.—Anterior wings slightly dentate, costa arched to the apices which are produced, chestnut brown varied with whitish grey and blackish. The two median lines distinct but narrow, separated above but nearing below: t. p. line strongly projected opposite the cell where it is bidentate, the inferior tooth greatly reduced, afterwards uniformly waved, without a sinus on the sub-median nervure which is shaded with black along its entire length. Reniform replaced by a black streak. Median shade well defined, stopping at the cell and thence ascending towards the terminal margin where it touches with black two or three nervules. Subterminal line whitish, undulate or zigzag, nearly perpendicular, touching in passing the exerted tooth of the t. p. line. Hind wings ochrey yellow, with a broad arcuated hind border, as usual interrupted and forming a spot at anal angle; median band narrow, slightly angulated, with two streaks of blackish scales joining it from the base. Beneath, the median band is broader, especially at costa towards which it nearly spreads to base. Primaries beneath entirely yellow to the first black band.

I have not identified Guenée's description which I here translate.

Size and habit of the European *C. protonympha*, which it nearly resembles.

**43. *Catocala polygama*, Guenée.**

Differs from the European *C. hymeneae* as follows:—♂.—The anterior wings are a little narrower, with the terminal margin more rounded, cinereous with a slight greenish tint, much more shaded and powdered with ferruginous, especially behind the t. p. line where this color brings into relief the dentate subterminal line. The ordinary lines are less clearly marked, their angles softened. The t. p. line is more lightly waved and, above the s. m. nervure, makes a profound sinus, broad, black and bordered with ferruginous. The median band of the hind wings more constricted on the cell, beyond more greatly arcuated or rounded and it is continued to the terminal margin. The hind broader is less largely intruded upon by yellow scales at the apex and the spot at anal angle is larger. The second joint of the palpi is notably securiform and the third slightly spatulate.

I translate Guenée's description. I have before me a number of specimens (Canada to Virginia) which differ in appearance among themselves but which I cannot separate into species, and which I refer to Guenée's *C. polygama*. The largest specimens are much shaded with whitish before the ordinary spots, while the median space behind is tinged with glaucous. The base of the fore wings is much shaded with deep brown, while the subterminal space is bright brown and usually strikes the eye. But again specimens are before me wanting all pale and bright brown colors, uniform dull brown and blackish and more like Guenée's indifferent figure. The expanse varies,



the Canadian specimens being smallest. The shade of the secondaries is not uniform. One specimen is remarkable for the increased size of the subreniform and the deep orange yellow secondaries. One specimen is shaded with blackish along internal margin of primaries. The terminal band of secondaries is sometimes disconnected from the anal spot. These specimens vary from 38 to 50 mm. in expanse. But the course of the ordinary lines remains nearly the same, and I think we have to do with a single variable species. The lower discal tooth of the t. p. line is sometimes reduced and the lines are nearer together at internal margin in some specimens. The sinus of the t. p. line is always deep and marked.

44. **Catocala amasia**, Guenée.

*Phalæna amasia*, Smith (upper figure).

This pretty species is rare in Collections and I have no specimens before me at the moment. In the Berlin Museum is a specimen from Georgia (Sieber).

45. **Catocala formula**, G. & R.

*Phalæna amasia*, Smith (lower figure).

*Catocala formula*, G. & R. Proc. Ent. Soc. Phil. Vol. 6. Plate 4, fig. 5 (1866).

♂ ♀.—There is little doubt that this very distinctively marked species, which is fully illustrated as above cited, is intended by Abbot as the male of *C. amasia*, and figured on the same Plate in the Insects of Georgia. My specimens are from the Middle States, however, and I have seen none yet from the South.

46. **Catocala connubialis**, Guenée.

"48 mm.—Primaries a little produced at apices, pale ashen with the two median lines tolerably approximate; the t. p. line followed by a second, parallel, but less distinct. Reniform annulate, complete; beneath it a second spot also annulate, rounded and joined to the two lines by a blackish streak. Hind wings yellow with a narrow median band, joining near the middle of the wing a black streak from the base, and narrow marginal band interrupted and forming a spot at anal angle."

Guenée describes this species together with its larva, which eats the leaves of *Cephalanthus occidentalis* (button bush), from a drawing of Abbot's, without reference to which it will probably be difficult to identify the species.

47. **Catocala grynea**, Cramer sp.

*Catocala nuptula*, Walker.

♂ ♀.—Primaries pale dull glaucous grey, squamation smooth and close. All the lines faint and indicated by bright brown scales. Sinus of the t. p. line deep and marked, below this there is a prominent bright brown shade on the margin; ordinary lines propinquitous at internal margin. Costal brown marks evident. Ordinary spots vague, pale ringed. Hind wings deep yellow; median

band joins a blackish ray from base, but appears beyond as a black spot on the margin. Hind border constricted but not disconnected before anal angle. Expanse 40 to 50 mm.

Eastern, Middle and Southern States. Quite common and not at all variable except in size. Cramer's figure of this easily recognised species cannot, I think, be mistaken.

#### 48. *Catocala praeclara*, G. & R.

*Catocala praeclara*, G. & R. Proc. Ent. Soc. Phil. Vol. 6. Plate 4, fig. 4 (1866).

♂ ♀.—Slighter than *C. grynea* which it imitates, but is quickly distinguished by the brilliant green reflection of the fore wings, the deep brown color of the subterminal space superiorly, which soils sub-apically the terminal space, and the pale yellow secondaries on which the hind border is disconnected. Expanse 40 to 44 mm.

Eastern and Middle States; less frequently occurring than *C. grynea*.

This species is fully illustrated as above cited. It does not vary and cannot be confounded with any other from the unusually strong gloss or sheen of the fore wings above.

#### 49. *Catocala fratercula*, G. & R.

*Catocala fratercula*, G. & R. Proc. Ent. Soc. Phil. Vol. 6. Plate 4, fig. 3 (1866).

♂ ♀.—A moderate species, varying in the distinctness of the median black shade, which ascends as usual to external margin. The median space is sometimes shaded with whitish before the reniform. There is no sinus to the t. p. line. The shape of the median band varies in being more or less acutely produced opposite anal constriction of the hind border. The primaries above vary in depth of color. Expanse 42 to 46 mm.

Rhode Island to Virginia (Kanawha). Not common.

#### 50. *Catocala minuta*, Edwards.

*Catocala parvula*, Edwards.

♂ ♀.—Smaller than the preceding species which it resembles in color. Primaries dull wood ashen with something of an ochraceous tint. T. p. line acutely dentate. Subterminal white serrated shade vivid and distinct, especially at costa, and this is a quick character. The general appearance of the primaries varies immensely. Sometimes the base is dead black; again the black color spreads to t. p. line; again it is confined to the internal margin; this latter variety is *C. parvula*, Edwards. Again the whole wing is blackish, except the vivid white subterminal shade which rarely is obsolete inferiorly. The thorax is always pale. Hind wings pale yellow; median band narrow, flexuous; hind border usually continuous, generally broken in var. *parvula*. Exp. 35 to 40 mm.

Rhode Island, New York; very common.

Some of the varieties of this little species are exceedingly pretty. I have been told the larva is to be found on the common Locust (Robinia).

#### 51. *Catocala gracilis*, Edwards.

*Catocala similis*, Edwards.

♂ ♀.—Primaries clear bluish grey varied with blackish. Lines faint, obsolete. A basal dash. Internal margin washed with blackish, broadly and

lightly, from t. a. line outwardly. T. p. line perpendicular with a broadly marked sinus, with one hardly prominent tooth. Two specimens in Mr. Edwards' Collection have the wings somewhat hoary and the lines more perceivable. These are labelled *similis*. This species has the primaries of a purer grey than usual. It approaches *C. androphila* in the appearance of the wings; the secondaries are deep yellow, with a narrow even median band discontinued much before the margin. Hind border discontinued and appearing again as a detached large spot near the angle. Beneath the band is attenuate. Thoracic lines distinct. Veins of the primaries above indicated. Expanse 40 to 42 mm.

New York, Rhode Island; not uncommon.

## 52. *Catocala androphila*, Guenée.

*Corisce amica*, Hübner.

♂ ♀.—Primaries pale gray, the lines fine, not very evident, the t. a. line the heavier marked. A distinct black median shade on costa above the reniform and continued beneath it, running upward to external margin below apex. A brown shade fills the space left by the exerted portion of the t. p. line beyond the reniform. This black median shade is marked on costa, but else sub-obsolete in all the males I have before me and the brown shading very faint. The t. p. line minutely dentate without prominent teeth. Subreniform small, pale and both spots inconspicuous and often incompletely ringed. The serrated sub-terminal white shade is tolerably distinct; fringes dark. Hind wings bright yellow; a broad black terminal band is squarely discontinued and appears as a black dot at anal angle. Fringes dark except at apex, where is a small yellow patch. Beneath the marginal band is brokenly and narrowly continued to anal angle and the median band is indicated by tolerably large spots or fragments. A specimen from Texas differs by its dirty, ochreous grey primaries much shaded with deep black and may be a distinct species. Expanse 40 to 45 mm.

Eastern States, southward. Not rare.

According to Guenée, who describes from Abbot's unpublished drawings, the larva feeds on oak. The specimen in the British Museum determined as "*Catocala amica*" is an *Ephesia elonympha*, Hübner.

## 53. *Catocala lineella*, Grote.

♂ ♀.—A little smaller than *C. androphila*. The primaries notably darker, being powdered with glaucous, bluish or greenish-grey, and black scales on a paler ground. Lines black and more distinct while similar to *C. androphila*; subreniform connected more or less evidently with the t. p. line. Serrated whitish subterminal shade and marginal black lunated line distinct. Secondaries deep yellow, a few dusky hairs at base. Terminal band much as in *C. androphila*. Beneath, the median band is merely expressed by two small disconnected dots, of which the upper is sometimes wanting and occasionally both. Expanse 36 to 38 mm.

Same localities as *C. androphila*.

Perhaps this is Guenée's var. *α* of *C. androphila*. I have a number of coincident specimens and I believe it to be distinct specifically.

54. **Catocala messalina**, *Guenée*.

♂.—Habit of *C. androphila*, but a little larger. Primaries of an even violaceous brownish grey, with all the anterior half shaded with pale grey. The ordinary lines are faint, flexuous, not angulated, nearly parallel and very contiguous inferiorly. Reniform continuous to the t. p. line. Hind wings pale ochre yellow, base a little dusky, without median band, but with a wide hind border continued to both margins, and having a single sinus not far from anal angle. Beneath, paler with traces of the median band. Abdomen slender, acute, brown beneath. Thorax grey, with a brown collar.

Not identified by me. I have translated Guenée's description on page 107, Vol. 3, of the *Noctuelites*. This species should be recognizable from the continuous hind border of the secondaries, an exceptional character of this group.

In addition to the above enumerated fifty-four species of the genus, of which seven have not been seen by me, Dr. Behr has described three species from the Western District in these Transactions which remain equally unknown to me. Most of the material I have used is in the collection of the American Entomological Society, together with Mr. Edwards' specimens kindly loaned me for examination.

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After writing so far my kind friend, Mr. Charles A. Blake, sends me specimens of two black winged species of *Catocala* from Pennsylvania which I describe here :

2. **Catocala lachrymosa**, *Guenée*.

♂.—Anterior wings dark, blackish, sparsely sprinkled with bluish cinereous, shaded with deep brownish on the sub-terminal space. Primaries a little more produced at the apices and the expanse greater compared with *C. epione*. T. a. line broadly marked on costa, thence thrice waved to internal margin, preceded by a cinereous shade which becomes whitish, broad and evident on the margin. T. p. line with two prominent discal teeth, a deep inflection below vein 2, distinctly preceded by whitish scales on the margin. The two lines are here very approximate. Sub-terminal line black, distinct, dentate, preceded by cinereous scales which are also more evident on internal margin as well as towards costa. Secondaries deep black, with white fringes, cut with black centrally. Beneath, the hind wings are largely whitish at base; beyond a narrow, rivulous white m. band. Thorax with black lines, similar in color to primaries. Abdomen black above; body whitish beneath. Expanse 80 mm.

This species seems in a measure intermediate between *C. epione* and *C. desperata*, while more nearly resembling the latter. Guenée's description is, as might be expected, trenchant and accurate. All the lines are very black and evident, though the two median are less broad than in *C. epione*, in appearance more as in *C. desperata*. The black sub-terminal is a ready character.

3 bis. **Catocala Robinsonii**, Grote.

♂ ♀.—I have alluded to this species above under *C. insolabilis*. The primaries are evenly smooth, pale greenish cinereous, without shades. This is a little stouter than *C. insolabilis*; larger and of a different hue compared with *C. retecta*. Median lines narrow and black. T. p. line acutely dentate; subreniform open. Median shade perceptible above reniform narrowly on costa, elsewhere not apparent. Median lines accompanied by pale shades. Subterminal indistinct, dentate, consisting of a darker outer and paler inner shade line. Hind wings black with white fringes. Beneath with narrow median white bands on both wings. Expanse 75 mm.

With the Californian species noticed by Dr. Behr, we have now fifty-eight (58) described North American species of *Catocala*, nine of which remain unknown to me.

**Descriptions of North American NOCTUIDAE.—No. 1.**

BY AUG. R. GROTE.

The typical specimens described in the present Series of Papers are contained in the Collection of Lepidoptera now belonging to the American Entomological Society and separately preserved, formerly the property of Mr. C. T. Robinson.

These descriptions have been written preparatory to a Revision of the North American Noctuidae, in which an attempt will be made to define the genera more completely and in accordance with the more recent classificatory views expressed by Lederer. — Dr. Herrich-Schaeffer's system for designating the nervulation has priority, seems the best and is used here.

1. **Hadena (mamestra) badistriga**, n. sp.—♂ ♀—Palpi thickly scaled, third joint small, concealed, maxillæ moderate, eyes hairy. ♂ antennæ simple, hind tibiae with two pair of small unequal spurs. Head and thorax blackish brown, collar pale. Anterior wings pale along costal region to beyond t. p. line. Ordinary spots obsolete. Of the usual lines only the t. a. and t. p. lines evident; these black, narrow, single, continuous, distinct. T. a. line running obliquely outwardly, roundedly projected to base of cell, thence inversely to internal margin. T. p. line evenly and greatly projected outwardly over the nervules without the cell, below which it runs inwardly and forms a notch on sub-median fold where it meets a broad blackish-brown shaded dash extending from base of wing to this point. A second similar dash along the disc, stretching from t. a. line along median fold. The wing is shaded with brown, more